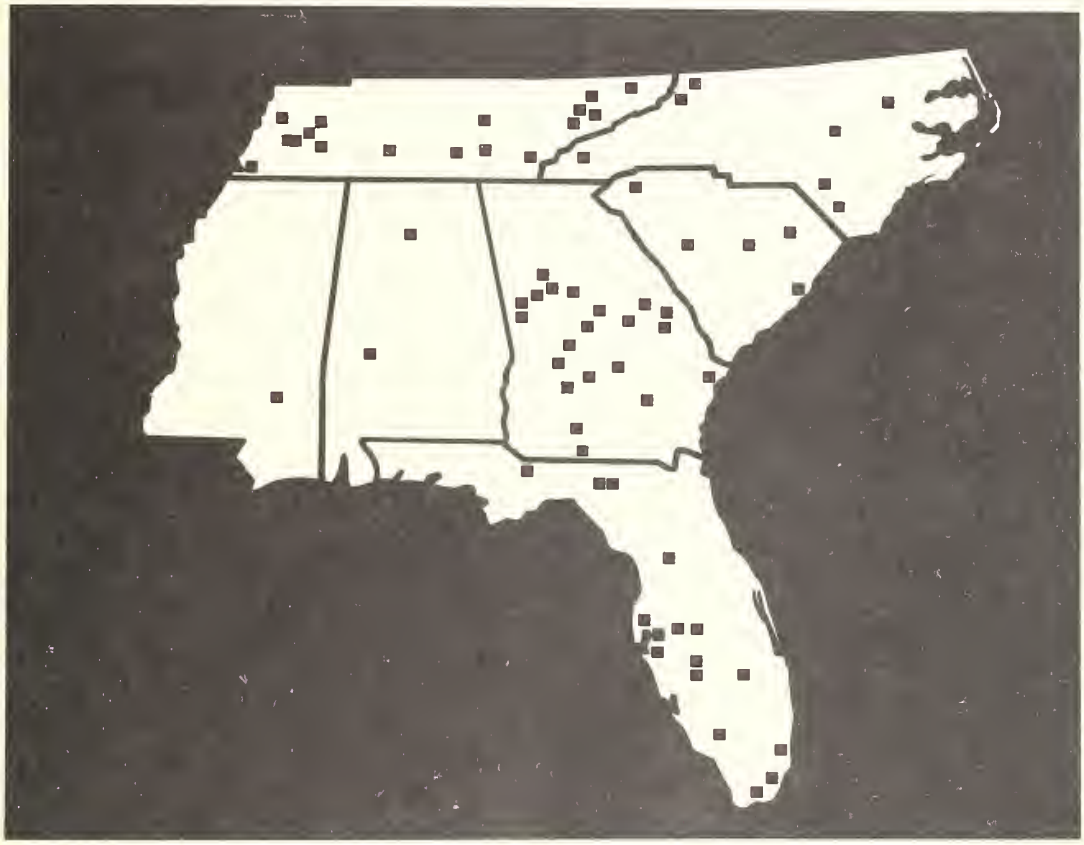
THE SOUTHEASTERN VEGETABLE PROCESSING INDUSTRY:

Location and Number of Plants, Composition, Volume, and Value of Pack, 1960



Marketing Research Report No. 527

UNITED STATES DEPARTMENT OF AGRICULTURE
Economic Research Service - Marketing Economics Division - Washington, D.C.

In cooperation with the Department of Agricultural Economics
Georgia Experiment Station - Experiment, Ga.

PREFACE

This study was made cooperatively by the Marketing Economics Division, Economic Research Service, United States Department of Agriculture and the Department of Agricultural Economics, Georgia Experiment Station, Experiment, Ga. It is a contributing project to the Southern Regional Marketing Project SM-8, "Evaluation of Alternative Vegetable Marketing Organizations and Handling Methods."

The study is part of a broad appraisal of the economic potentials of processing as an outlet for vegetables produced in the Southeast. Subsequent reports will be devoted to a more detailed description of methods and areas of raw vegetable procurement, and the methods and areas of distribution of finished products.

This study was carried out under the general supervision of Dr. Newton M. Penny, Head, Department of Agricultural Economics, Georgia Experiment Station, and Loyd C. Martin, Head, Horticultural Crops Section, Marketing Economics Division, United States Department of Agriculture.

The authors gratefully acknowledge the cooperation and support of the vegetable processors who contributed information requested. Mrs. Ula Vickers, National Canners Association, Washington, D. C., and Mr. E. J. Webster, Jr., National Association of Frozen Food Packers, Washington, D. C., made valuable contributions.

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February 1962

SUMMARY

Processing as a market outlet for vegetables produced in the Southeast traditionally has been secondary to fresh markets. But changes in areas of vegetable production and increasing competition in vegetable markets have generated much interest in the future of the Southeastern vegetable industry. Current research, therefore, is designed to evaluate the economic feasibility of processing as an outlet for vegetables produced in the region.

The development of the vegetable processing industry in the Southeast has been characterized by substitution, addition, and deletion of product lines. Nearly a fifth of the plants were established for processing fruit, and vegetable lines were added later. Most of the other plants, when they were first set up, processed only one vegetable -- principally tomatoes, pimentos, okra, or sweetpotatoes. By 1960, about half of the plants processed only one or two vegetables, and many also processed fruit, berries, pre-processed vegetables, or specialty products.

Plants in the 7 Southeastern States in 1960 processed 476 million pounds of vegetables with a raw product value of $16 million. Sixty-eight percent of this volume was processed by 58 canning plants and 32 percent by 12 freezing plants.

Canners packed approximately 11 million 24-303 case equivalents of fresh vegetables with an "at-plant-value" of $32 million. Ninety-six million pounds of finished vegetable product were frozen with a value of $15 million. Combined gross revenue to the canning and freezing industries was $47 million.

Deducting the cost of vegetable raw product and the estimated cost of packaging materials from gross returns, the value added in 1960 by the vegetable processing industry was estimated at $18.8 million. The ratio of value added to returns from finished product was 0.37 for canners and 0.43 for freezers.

The survey of the vegetable processing industry which provided data for this report was conducted in the Spring of 1961 in Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee. Sixty-one firms operating 70 processing plants cooperated by supplying information on their 1960 operations. Only plants known to have been processing fresh vegetables in the 1960 season were contacted for interviews.

THE SOUTHEASTERN VEGETABLE PROCESSING INDUSTRY: LOCATION AND NUMBER OF PLANTS -- COMPOSITION, VOLUME, AND VALUE OF PACK, 1960

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INTRODUCTION

Production of vegetables in the Southeastern States traditionally has been primarily for fresh market outlets. 1/ Though processing has been secondary to the fresh market as a market outlet it has added appreciably to market stability. It has absorbed surplus production that could not be disposed of profitably through existing fresh market outlets. The economic importance of processing, therefore, is proportionately greater than its share of total vegetable production in the region indicates.

During the years between 1930 and 1950, many new canning facilities were established throughout the Southeast. Many were small operations that depended on local farms for supplies of raw product; since 1945, the fatality rate of these small plants has been high. At least 41 in the Southeast failed between 1945 and 1960. Though total volume of vegetables processed by them was small relative to national supply, their failure had a serious impact on local vegetable producers who often were left without an alternative market for their produce.

Total acreage devoted to vegetable production in the Southeast has declined steadily since 1957 (fig. 1, table 11) and production has substantially decreased since 1955 (fig. 2, table 12). A decline in the importance of the vegetable industry in the region is evident. But the data given in official reports emphasize the vegetables of greatest commercial importance in the United States; they do not include several vegetables that have commercial importance for fresh market and for processing within the Southeastern States.

The apparent decline in importance of the entire vegetable industry in the Southeast has stimulated interest in processing as a potential outlet for a larger share of the vegetable production. Interest has been particularly strong among those concerned with the economic development and agricultural stability of the region. Farmers, agricultural leaders, and others have suggested that the economy of the region and farm income would be benefited by expanding processing operations to supplement fresh market outlets.

1/ Southeastern States in this report include Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee.

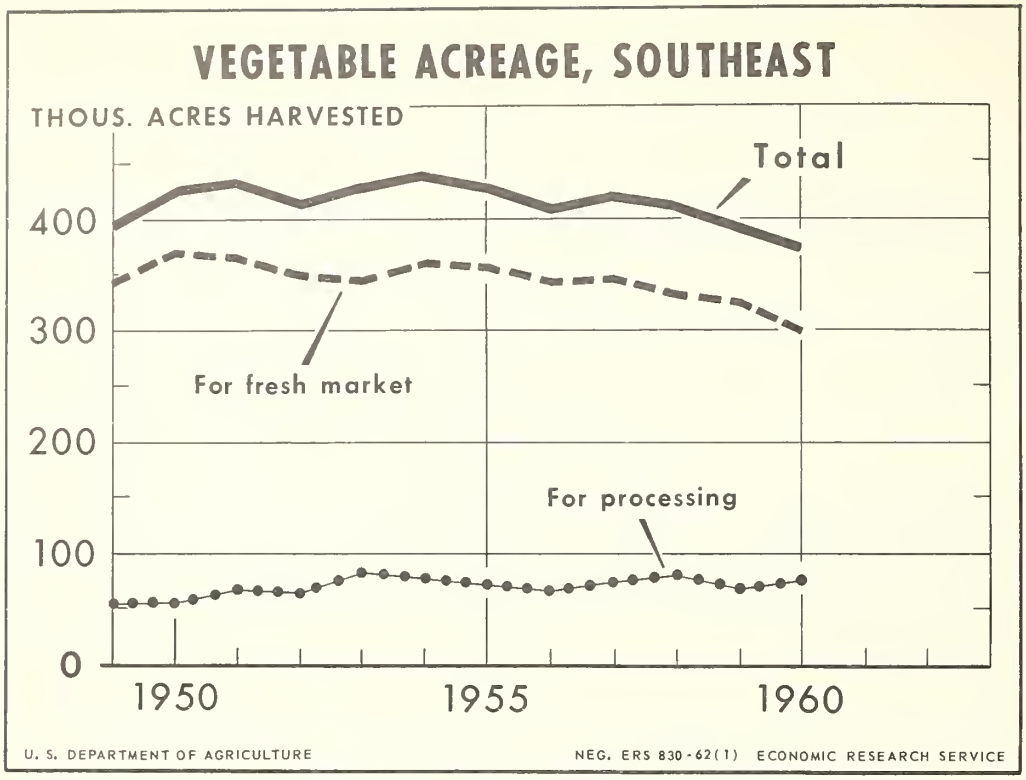

Figure 1

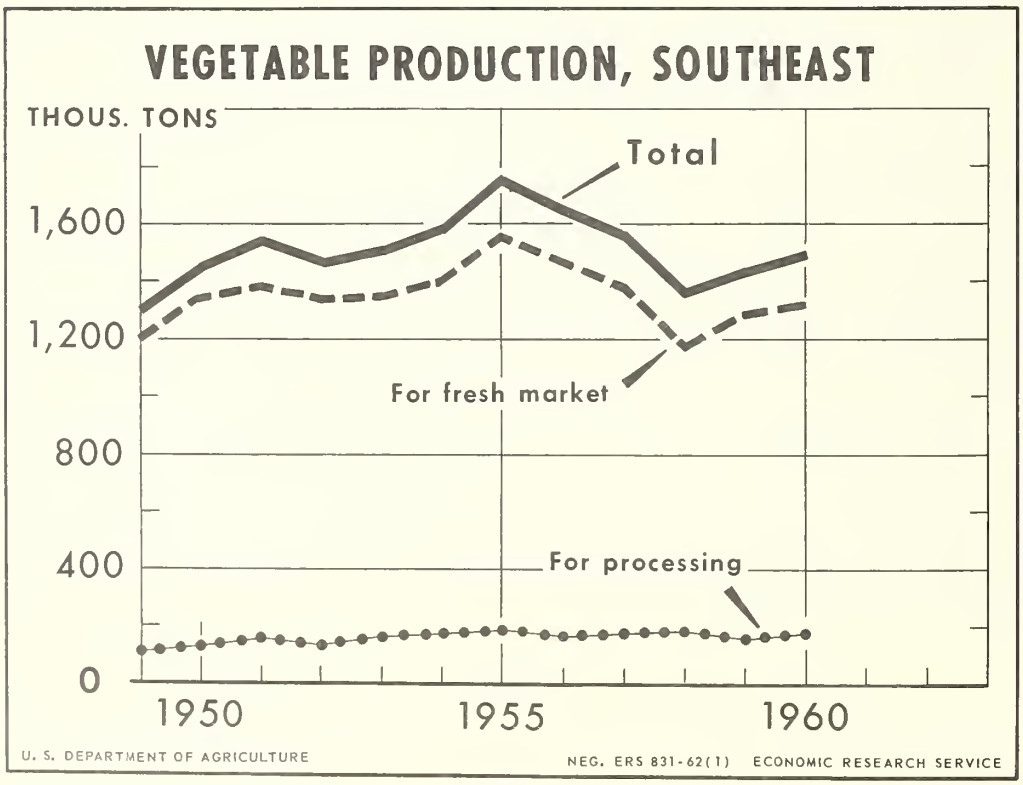

Figure 2

THE PROBLEM

What is the long-run potential for vegetable processing in the Southeast? What processing capacity is required to supply the present and future potential markets for the canned and frozen vegetables that can be produced profitably in the region? What products offer the greatest opportunities? To what extent do opportunities exist for expanding regional and national consumer markets for Southeastern vegetables? What is the relationship between fresh market prices and availability of vegetables for processing? These questions exemplify the complexity of economic relationships involved in judging the feasibility of processing as an outlet for vegetables produced in the Southeast.

A sound decision by an individual, a public agency, or a processing firm regarding the expansion, contraction, or maintenance of the vegetable processing industry requires a careful appraisal of the many economic criteria on which the success of the industry depends. Evidence supporting such decisions for the industry as a whole is meager.

The purpose of this research program is to provide an appraisal of the economic feasibility of processing as an outlet for vegetables produced in the Southeast. This requires research designed to evaluate production potentials, alternative markets, the relative profitability of investing productive resources in processing operations, and present and projected future markets for Southeastern processed vegetables.

The specific objectives of this report are to describe the size, geographic distribution, and composition of the vegetable processing industry in the Southeast. This is the first of a planned series of interrelated reports, each of which will be designed to contribute to the overall objective of providing related information on which sounder decisions may be based.

Method of Study

A survey was made of 61 firms that operated 70 vegetable canning and freezing plants within the 7-state Southeastern Region (map on cover page and table 1). Information was obtained through personal interviews with executives of the firms cooperating in the study. The survey was conducted in the spring of 1961 and included all plants known to process fresh vegetables. Data were obtained for the calendar year 1960 except in a few cases where data were reported for the 1960-61 season. Firms that processed only soup, juice, condiment, relish, pickle, sweetpotatoes and fruit, and firms in other States that procured their raw product supplies in the 7-state area were excluded. Firms processing fruit, juice, sweetpotatoes, and speciality products were included only if they also processed fresh vegetables.

BUSINESS ORGANIZATION OF FIRMS

The business structure of the firms was as follows: 62 percent were corporations; 25 percent, partnerships; 10 percent, proprietorships; and 3 percent, cooperatives. Three corporations were subsidiary firms owned or controlled by a parent organization.

Several national food processors with general offices in other parts of the country have subsidiary plants in the Southeast. These plants were organized, originally, as proprietorships and later were sold to national firms.

Table 1.--Number and location of vegetable canners and freezers, 7 Southeastern States, 1960

State	Canners		Freezers		Total	
	Firms	Plants	Firms	Plants	Firms	Plants
	Number	Number	Number	Number	Number	Number
Alabama	1	2	0	0	1	2
Florida	15	15	1	2	16	17
Georgia	16	18	3	3	19	21
Mississippi	1	1	0	0	1	1
North Carolina	7	7	0	0	7	7
South Carolina	5	5	0	0	5	5
Tennessee	8	10	4	7	12	17
Total	53	58	8	12	61	70

DEVELOPMENT OF VEGETABLE PROCESSING LINES

Many plants were originally established to process one product such as tomatoes, peaches, or pimentos. Successful development of these plants required adjustments consistent with changes in farm production, processing costs, and competitive market structures. In most plants this caused introduction of new products, substitution of products, and in some cases experimentation to find more profitable product combinations.

Nineteen percent of the plants established their operations for fruit processing alone but later added vegetables. Sixty-three percent were established with only one vegetable product and, in 1960, 31 percent continued to process one vegetable.

Tomatoes, pimentos, okra, sweetpotatoes, green beans, and fruit were among the most popular lines when plants began operations (table 2). The wide variety of vegetables that have been added and discontinued by plants since their establishment is shown in table 3. The principal vegetables added were green beans, field peas, collards and mustard greens. Plants that added particular products are not necessarily the same ones that discontinued them. Sixteen plants reported that no new products had been added since establishment and 27 reported no products discontinued.

Plants processing only one or two vegetable items predominated in 1960 (table 4), but many of these also processed fruit, berries, pre-processed vegetables, and specialty products. Twelve of the plants processed one vegetable only and had no other product lines. Seven of the 12 initially began their operations with the one product processed in 1960. The average number of vegetables processed by all plants in 1960 was 3.8 and ranged from 1 to 18.

VOLUME AND COST OF RAW PRODUCT PROCURED IN 1960

Approximately 476 million pounds of raw vegetables were procured for processing by canning and freezing plants. The estimated delivered-to-plant value was $16 million. Of the total quantity, 68 percent was processed by canning plants and 32 percent by freezing plants (table 5). The volume processed by individual

Table 2.--Number of plants processing specified items when plants were originally established, 7 Southeastern States 1/

Item	Alabama	Florida	Georgia	Mississippi	North Carolina	South Carolina	Tennessee	Total
	Number	Number	Number	Number	Number	Number	Number	Number
Blackeye peas	---	---	---	---	---	---	1	1
Cabbage	---	---	---	1	1	---	---	2
Carrots	---	---	---	---	2	---	---	2
Cauliflower	---	---	---	---	1	---	---	1
Collard greens	---	---	---	---	---	---	2	2
Corn	---	---	1	---	1	1	---	3
Field peas	---	1	6	---	---	---	---	7
Green beans	---	5	---	---	4	3	3	15
Irish potatoes	---	---	1	---	1	1	---	3
Kale	---	---	---	---	---	---	2	2
Lima beans	---	---	---	---	---	---	1	1
Mustard greens	---	---	---	---	---	---	2	2
Okra	1	---	2	---	1	2	4	10
Onions	---	---	1	---	1	---	1	3
Pimientos	---	1	7	---	1	---	2	11
Spinach	---	---	---	---	---	1	---	1
Squash	---	---	1	---	1	---	2	4
Sweet peppers	---	---	---	1	1	---	2	4
Sweetpotatoes	1	---	3	---	5	1	---	10
Tomatoes	---	8	3	---	1	2	6	20
Turnip roots	---	---	---	---	---	---	1	1
Turnip greens	---	---	1	---	---	1	2	4
Fruit 2/	---	5	7	1	3	2	6	24
Seafood	---	---	---	---	---	1	---	1
Other 3/	---	1	---	---	1	---	---	2

1/ Plants are not additive since some processed more than one product.
2/ Includes berries.
3/ Speciality items.

Table 3.--Number of plants adding and discontinuing selected vegetable items since initial operation, 7 Southeastern States

Vegetable	Adding	Discontinuing
	Number	Number
Blackeye peas	10	0
Broccoli	3	2
Collards	16	5
Corn	4	2
Field peas	16	5
Green beans	17	7
Irish potatoes	14	6
Kale	8	2
Lima beans	2	0
Mustard greens	15	2
Okra	9	4
Pimientos	5	0
Spinach	8	1
Squash	14	0
Sweet peppers	3	0
Sweetpotatoes	7	5
Tomatoes	12	10
Turnip roots	7	4
Turnip greens	12	3

canning plants ranged from 4,000 to 38 million pounds and by freezing plants from 300,000 to 45 million pounds. The average volume per canning plant was 5.6 million pounds and per freezing plant 12.5 million pounds.

More than 70 percent of the industry volume was processed by 25 percent of the plants and 10 plants accounted for more than 60 percent of the total raw product processed (fig. 3). The 20 smallest volume plants processed less than three percent of the total raw product.

The relative economic importance of individual vegetables as a percentage of the total volume procured in 1960 was: Green beans, 19 percent; tomatoes, 16 percent; pimentos, 10 percent; and Irish potatoes, 7 percent (fig. 4, table 6). These four vegetables comprised 52 percent of the total.

In volume of vegetables procured Tennessee was the leading State in the region (fig. 5 and table 6). The total in individual States ranged from a high of 183 million pounds in Tennessee to a low of 3.5 million pounds in South Carolina. Eighty-three percent of the total volume was bought by plants in Tennessee, Georgia, and Florida.

Kinds of vegetables procured for processing varied among States. Plants in Tennessee procured the greatest volumes of green beans, blackeye peas, collards, mustard, okra, and turnip greens. Plants in Georgia led in volume of field peas, Irish potatoes, pimentos, and squash. Plants in Florida led in tomatoes and spinach, and plants in North Carolina procured the largest share of sweet peppers.

Table 4.--Number of plants in Southeastern States processing specified number of vegetables in 1960 compared to the number when plants were originally established

Number of vegetables	Alabama		Florida		Georgia		Mississippi		North Carolina		South Carolina		Tennessee		Total	
	Orig.	1960	Orig.	1960	Orig.	1960	Orig.	1960	Orig.	1960	Orig.	1960	Orig.	1960	Orig.	1960
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
0	---	---	3	---	1	---	---	---	---	---	1	---	1	---	6	---
1	---	---	11	7	15	4	---	---	5	4	1	1	8	4	40	20
2	1	---	1	5	---	3	1	---	1	1	1	2	2	2	7	13
3	---	---	1	---	2	8	---	---	---	1	1	1	2	1	6	11
4	---	---	---	1	---	1	---	---	---	1	---	---	---	2	---	5
5	---	---	---	1	1	1	---	---	---	---	1	---	---	---	2	2
6	---	---	---	---	---	---	---	---	1	---	---	---	1	1	2	1
7	---	---	---	1	---	---	---	---	---	---	---	1	---	1	---	3
8	---	---	---	---	---	1	---	---	---	---	---	---	1	1	1	2
9	---	---	---	---	---	---	---	---	---	---	---	---	---	2	---	2
10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
11	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	1
12	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	1
16	---	---	---	1	---	---	---	1	---	---	---	---	---	---	---	2
17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	1
Total 1/	1	1	16	16	19	19	1	1	7	7	5	5	15	15	64	64

1/ Total number of plants shown does not agree with total number reported in table 1. If two or more plants were under common management, the operations of all plants were recorded as one and detailed information was not obtained on individual plants.

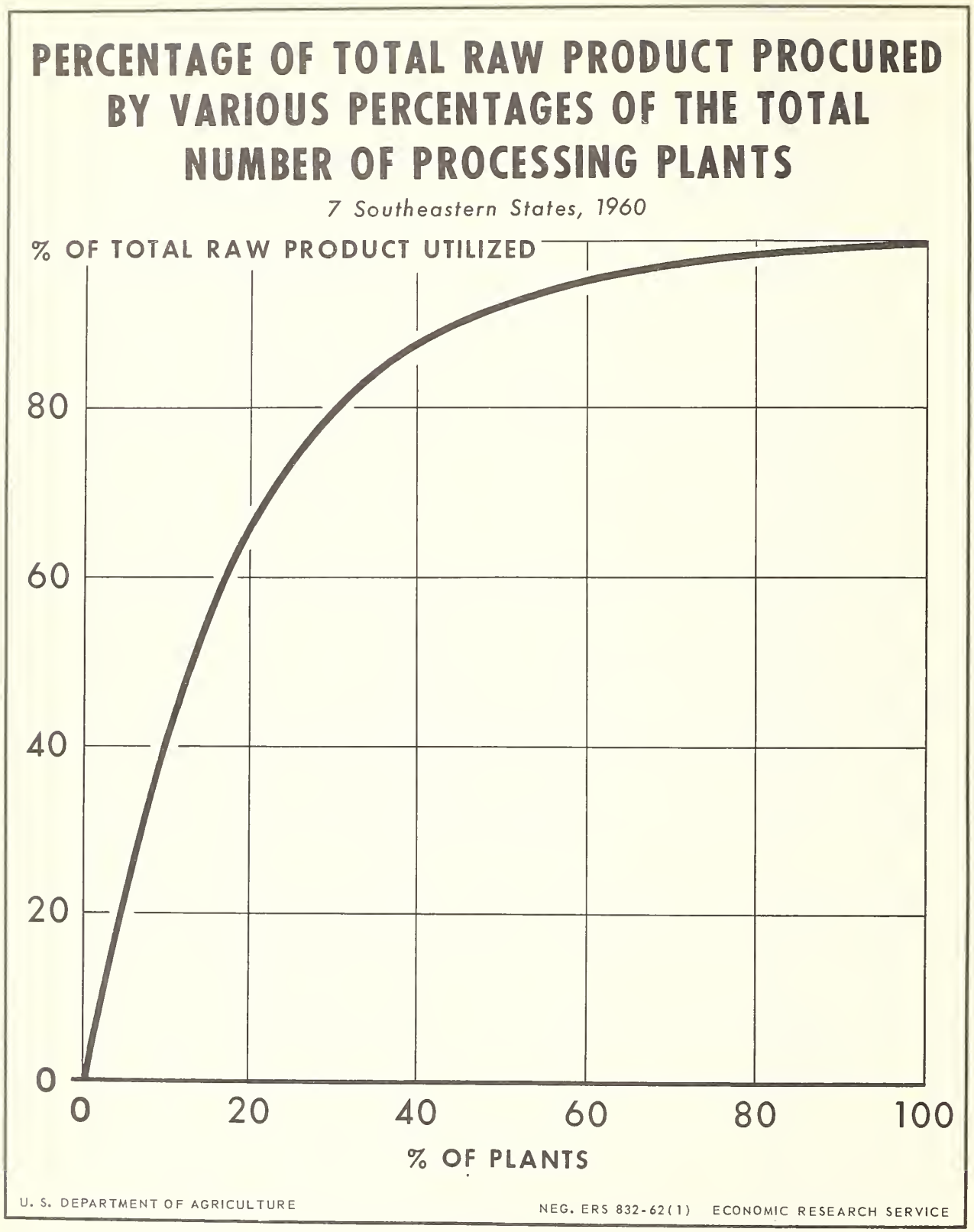
PERCENTAGE OF TOTAL RAW PRODUCT PROCURED BY VARIOUS PERCENTAGES OF THE TOTAL NUMBER OF PROCESSING PLANTS
7 Southeastern States, 1960
% OF TOTAL RAW PRODUCT UTILIZED
80
60
40
20
0
0
20
40
60
80
100
% OF PLANTS
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Figure 3

Table 5.--Raw product procurement by type of processing, 70 plants, 7 Southeastern States, 1960

Vegetable	For freezing		For canning		Total
	Pounds	Percent	Pounds	Percent	Pounds
Blackeye peas	23,407,953	97	640,000	3	24,047,953
Cabbage	--	0	20,000,000	100	20,000,000
Collards	6,294,200	74	2,207,965	26	8,502,165
Corn	350,000	6	5,340,000	94	5,690,000
Field peas 1/	10,542,715	40	15,925,000	60	26,467,715
Green beans	31,966,290	35	59,676,620	65	91,642,910
Irish potatoes	11,793,000	36	20,532,200	64	32,325,200
Kale	3,222,450	61	2,058,000	39	5,280,450
Lima beans	5,241,000	87	806,800	13	6,047,800
Mustard greens	5,594,845	50	5,687,315	50	11,282,160
Okra	16,040,100	80	4,002,000	20	20,042,100
Pimientos	--	0	49,580,790	100	49,580,790
Spinach	6,657,740	60	4,421,270	40	11,079,010
Squash	5,726,000	61	3,726,000	39	9,452,000
Sweet peppers 2/	246,357	1	18,228,000	99	18,474,357
Sweetpotatoes	1,750,000	8	21,324,000	92	23,074,000
Tomatoes	--	0	76,845,591	100	76,845,591
Turnip roots	3,031,900	100	--	0	3,031,900
Turnip greens	17,012,640	55	13,752,275	45	30,764,915
Other 3/	1,069,900	51	1,028,000	49	2,097,900
Total	149,947,090	32	325,781,826	68	475,728,916

1/ Includes lady peas, white acre peas, cream peas, and crowder peas.
2/ Also includes bell and green peppers.
3/ Includes broccoli, cauliflower, egg plant, onions, and rutabagas.

Raw product utilization reported by plants in the various States should not be construed to indicate the State or area in which the vegetables were grown. Many plants obtained their raw product from several adjacent States and, in some cases, from production areas scattered throughout the United States. A detailed analysis of the methods and geographic areas of raw product procurement is to be published later.

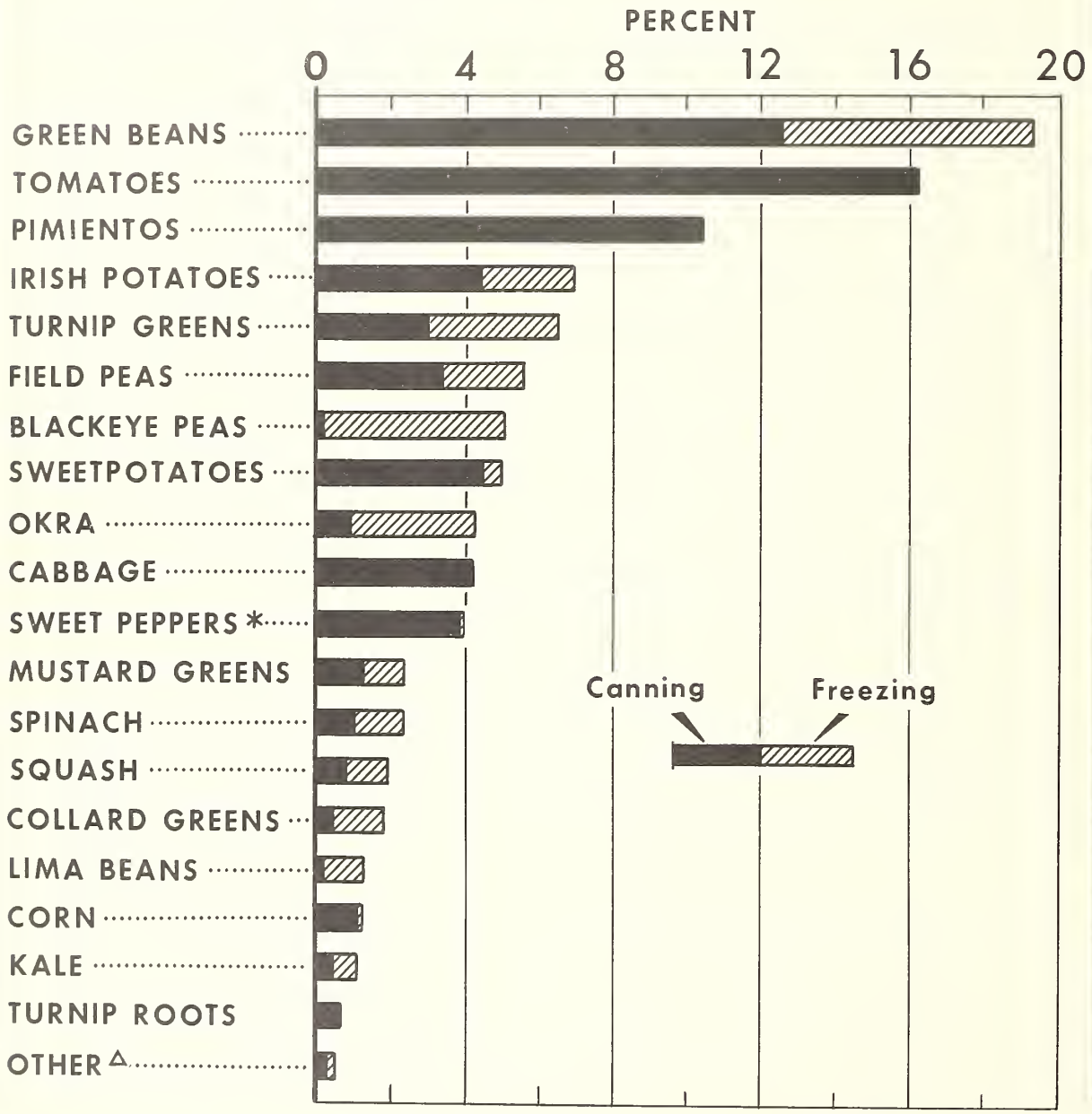
The cost of raw product shown in table 7 reflects costs incurred by processors--it includes amounts paid to growers, cost of transportation from farm or assembly station to the plant, and brokerage and commission fees, if paid.

The relative importance of different vegetables changes when cost or value, rather than volume, is considered. Green beans remain the leading vegetable, followed by pimentos, tomatoes, and field peas. Payments for these four vegetables amounted to 65 percent of the total payments for raw product. The relative position of the States remain the same whether comparing volume or cost (table 7).

Many of the plants operated a variety of product lines other than vegetables. All firms processed fresh vegetables and 35 of them processed vegetables only; 23 also had fruit lines, one processed meat, and one seafood.

PERCENTAGE CONTRIBUTION OF SELECTED VEGETABLES TO TOTAL VOLUME OF VEGETABLE RAW PRODUCT PROCESSED AND TYPE OF UTILIZATION

70 Processing Plants, 7 Southeastern States, 1960



* ALSO INCLUDES BELL AND GREEN PEPPERS.

△ INCLUDES BROCCOLI, CAULIFLOWER, EGG PLANT, ONIONS, AND RUTABAGAS.

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Figure 4

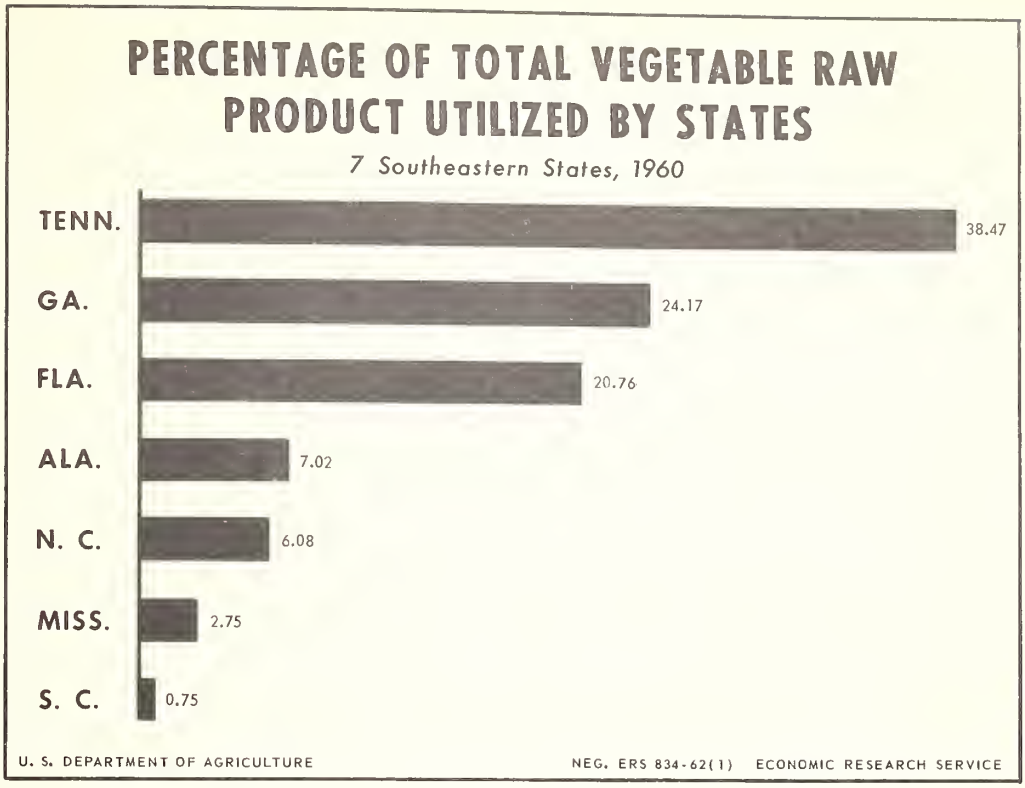

Figure 5

The contribution of each type of raw product to the total volume of all firms is shown in figure 6. In some firms vegetables comprised as little as 10 percent of the total raw product. In addition to the 476 million pounds of fresh vegetables processed, the firms processed 123 million pounds of fruit, 6 million pounds of meat, and 300 thousand pounds of seafood. Included in "other" are about 1.5 million pounds of peanuts. Combining all types of raw product, the 70 plants processed a total of 606 million pounds in 1960.

TYPE OF CONTAINERS, VOLUME, AND VALUE OF 1960 PACK

Canned vegetables were packed in a wide assortment of can and glass jar sizes ranging from the 2-ounce pimento jar to Number 10 institutional size cans. The most commonly used type of pack, the Number 303 can, hence all canned pack-out data were converted to cases of 24-303's. 2/

Frozen vegetables were packed in containers ranging in size from 4-ounce packages to 60-pound bulk packages. The most common packs were cases of 24-10 ounce and 12-2 1/2 pound packages.

Canners in the 7 State area packed approximately 11 million cases of vegetables valued at $32 million. 3/ Freezers packed 96 million pounds of frozen vegetables valued at $15 million (table 8).

2/ Conversion factors were obtained from The Almanac of Canning, Freezing, Preserving Industries, 1960 Edition, Edward E. Judge, Westminister, Md.

3/ Estimated wholesale value at plant.

Table 6.--Quantity of vegetables procured and number of plants processing in individual States, 70 canning and freezing plants, 1960

Vegetable	Alabama		Florida		Georgia		Mississippi		North Carolina		South Carolina		Tennessee		Total	
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Blackeye peas	---	---	1	1/	2	1/	1	1/	---	---	---	---	4	17,718,953	8	24,047,953
Broccoli	---	---	1	1/	1	1/	---	---	---	---	---	---	---	---	2	1/
Cabbage	---	---	---	---	---	---	---	---	1	1/	---	---	2	1/	3	20,000,000
Cauliflower	---	---	1	1/	---	---	---	---	---	---	---	---	---	---	1	1/
Collards	---	---	2	1/	3	3,033,965	1	1/	---	---	---	---	5	4,492,200	11	8,502,165
Corn	---	---	1	1/	1	1/	---	---	---	---	---	---	1	1/	3	5,690,000
Egg plants	---	---	1	1/	1	1/	---	---	---	---	---	---	---	---	2	1/
Field peas	1	1/	2	1,265,000	9	13,600,000	1	1/	---	---	---	---	3	7,634,715	16	26,467,715
Green beans	1	1/	6	15,685,770	3	11,697,850	1	1/	3	9,440,000	3	1,824,000	8	51,583,290	25	91,642,910
Irish potatoes	1	1/	3	2,234,200	2	1/	1	1/	1	1/	1	1/	2	1/	11	32,325,200
Kale	---	---	1	1/	1	1/	1	1/	---	---	---	---	5	4,089,450	8	5,280,450
Lima beans	---	---	---	---	1	1/	---	---	---	---	---	---	3	5,006,800	4	1/
Mustard greens	1	1/	2	1/	2	1/	1	1/	---	---	---	---	5	6,190,845	11	11,282,160
Okra	1	1/	1	1/	2	1/	1	1/	1	1/	3	300,000	5	11,009,100	14	20,042,100
Onions	---	---	---	---	1	1/	---	---	---	---	---	---	1	1/	2	1/
Pimientos	1	1/	1	1/	9	36,354,790	1	1/	1	1/	---	---	3	4,876,000	16	49,580,790
Rutabagas 2/	---	---	---	---	1	1/	---	---	---	---	---	---	---	---	1	1/
Spinach	1	1/	3	3,935,270	2	1/	1	1/	---	---	---	---	5	3,050,740	12	11,079,010
Squash	1	1/	2	1/	6	5,158,000	1	1/	---	---	1	1/	2	1/	13	9,452,000
Sweet peppers 3/	---	---	1	1/	---	---	---	---	1	1/	---	---	4	13,424,357	6	18,474,357
Sweetpotatoes	1	1/	1	1/	1	1/	1	1/	3	8,250,000	---	---	1	1/	8	23,074,000
Tomatoes	1	1/	10	66,903,209	2	1/	---	---	1	1/	4	1,325,000	3	1,382,382	21	76,845,591
Turnip roots	---	---	1	1/	1	1/	---	---	---	---	---	---	3	2,148,900	5	3,031,900
Turnip greens	---	---	3	1,292,000	4	12,238,275	1	1/	---	---	---	---	6	16,086,640	14	30,764,915
Total		1/		98,792,949		114,993,695		1/		28,920,000		3,519,000		182,989,272		475,728,916

1/ Publication of data would reveal individual plant operations.
2/ Data incomplete.
3/ Also includes bell and green peppers.

Table 7.--Cost of raw product procured by 70 vegetable processing plants, by State and vegetable, 7 Southeastern States, 1960 1/

Vegetable	Alabama	Florida	Georgia	Mississippi	North Carolina	South Carolina	Tennessee	Total
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Blackeye peas	---	2/	2/	2/	---	---	764,602	996,811
Cabbage	---	---	---	---	2/	---	2/	194,000
Collards	---	2/	57,286	2/	---	---	73,318	147,604
Corn	---	2/	2/	---	---	---	2/	70,050
Field peas	2/	58,980	478,091	2/	---	---	389,509	1,062,335
Green beans	2/	980,282	779,661	2/	423,075	78,150	3,470,913	5,791,773
Irish potatoes	2/	27,950	2/	2/	2/	2/	2/	575,623
Kale	---	2/	2/	2/	---	---	64,990	96,643
Lima beans	---	---	2/	---	---	---	362,256	403,896
Mustard greens	2/	2/	2/	2/	---	---	97,266	172,380
Okra	2/	2/	2/	2/	2/	16,951	606,173	974,981
Pimientos	2/	2/	1,855,603	2/	2/	---	192,336	2,440,499
Spinach	2/	64,794	2/	2/	---	---	75,815	242,487
Squash	2/	2/	135,306	2/	---	2/	2/	265,176
Sweet peppers 3/	---	2/	---	---	2/	---	353,782	501,782
Sweetpotatoes	2/	2/	2/	2/	157,500	40,130	2/	443,482
Tomatoes	2/	1,101,779	2/	---	2/	---	17,802	1,266,316
Turnip roots	---	2/	2/	---	---	---	38,912	57,632
Turnip greens	---	20,224	192,734	2/	---	---	254,145	482,027
Other 4/	---	9,683	60,483	---	---	---	15,520	85,686
Total	2/	2,524,592	4,341,721	2/	801,425	137,056	7,287,714	16,271,183

1/ Computed from reported volume of vegetables procured and unit price paid on delivery to processing plants.

2/ Publication of data would reveal individual plant operations.

3/ Also includes bell and green peppers.

4/ Includes broccoli, cauliflower, egg plant, onions, and rutabagas.

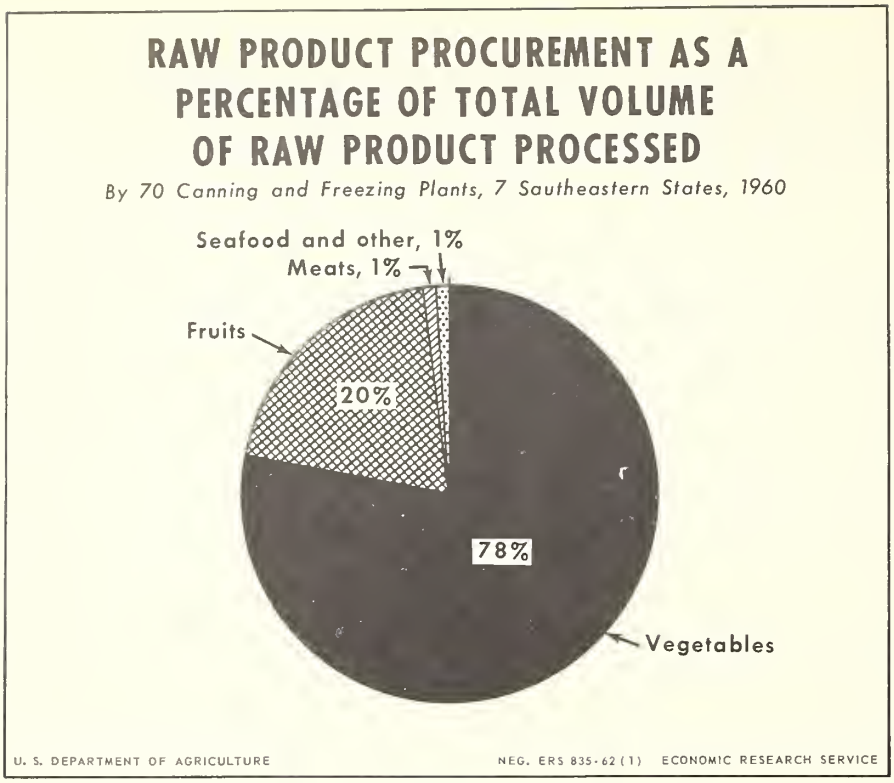

Figure 6

The most important canned vegetable in volume and value was green beans. Canned tomatoes were second in volume, followed by sweetpotatoes and pimentos. The value of pimentos was second to that of green beans. Green beans, tomatoes, sweetpotatoes, and pimentos were the most important contributors to the total volume (64 percent) and value (69 percent) of the vegetable pack.

The product emphasis differed for frozen vegetables. Green beans still led all others in volume and value. The volume and value of okra, blackeye peas, and turnip greens were more prominent in the frozen than in the canned form.

When the values of canned and frozen vegetables are combined, green beans show the greatest contribution, followed by pimentos, tomatoes, and field peas. Thirteen products, each having a value exceeding $1 million, accounted for 90 percent of the value of all processed vegetables in the Southeast (table 8).

The relative importance of each State in volume and value of the vegetable pack is shown in table 9. Tennessee led all States in quantity and value of both canned and frozen vegetables. Although Florida canners packed a larger number of cases than Georgia plants, value of the Georgia pack was greater. This is a result of the high unit value of pimentos, which were a large part of the Georgia pack.

Survey respondents were asked what percentage of their gross revenue in 1960 was derived from vegetables, fruits, meats, seafood, and other products. Vegetables made the largest contribution to revenue and fruits were second. (fig. 7). This differs from th relative importance of volume of vegetables and fruits processed by plants as shown in figure 6.

Table 8.--Volume and wholesale value of canned and frozen vegetables packed, 70 plants, by product, 7 Southeastern States, 1960

Product	Canned		Frozen		Total value canned and frozen
	Cases 24 - 303's	Value	Pounds	Value	
	Number	Dollars	Number	Dollars	Dollars
Beans:					
Green	3,247,599	8,037,706	17,944,900	3,120,590	11,158,296
Green and potatoes	137,083	238,778	---	---	238,778
Lima	1/	1/	5,368,337	1,096,203	1,096,203
Collards	67,287	119,595	5,378,757	636,800	756,395
Corn	1/	1/	1/	1/	1/
Greens:					
Mixed	1/	1/	---	---	1/
Mustard	80,573	140,899	3,763,662	418,180	559,079
Spinach	165,039	339,918	4,752,654	579,434	919,352
Turnip	461,655	651,593	10,119,136	1,154,574	1,806,167
Turnip with roots	---	---	3,522,434	408,252	408,252
Kale	1/	1/	2,957,927	290,447	290,447
Kraut and Kraut juice	501,953	1,254,690	---	---	1,254,690
Okra	93,099	245,253	14,934,035	2,341,641	2,586,894
Okra, corn, and tomatoes	33,815	126,816	---	---	126,816
Okra and tomatoes	137,599	491,748	---	---	491,748
Peas:					
Blackeye	39,413	108,521	10,653,550	1,840,362	1,948,883
Field	562,820	1,976,161	5,467,658	1,118,065	3,094,226
Pepper:					
Pimiento	832,744	7,154,196	---	---	7,154,196
Sweet 2/	518,808	1,786,762	1/	1/	1,786,762
Potatoes:					
Irish	585,332	1,106,522	1/	1/	1,106,522
Sweet	898,313	2,252,316	1/	1/	2,252,316
Squash	184,577	516,851	4,709,833	677,500	1,194,351
Tomatoes and tomato extracts	1,702,618	4,237,999	---	---	4,237,999
Other 3/	424,067	1,160,852	6,599,923	1,282,505	2,443,357
Total	10,674,394	31,947,176	96,172,806	14,964,553	46,911,729

1/ Publications of data would reveal individual plant operations.
2/ Also includes bell and green peppers.
3/ Includes canned lima beans, corn, mixed greens, kale, and rutabagas; includes frozen broccoli, cauliflower, corn, egg plant, onions, Irish potatoes, sweet peppers, and sweetpotatoes.

Table 9.--Volume and value of canned and frozen vegetables packed, 70 plants, by state, 7 Southeastern States, 1960

State	Canned		Frozen	
	Cases 24 - 303's	Value	Pounds	Value
	Number	Dollars	Number	Dollars
Alabama	1/	1/	--	--
Florida	2,325,485	5,790,535	1/	1/
Georgia	2,135,959	8,738,657	25,335,500	3,840,893
Mississippi	1/	1/	--	--
North Carolina	1,453,838	3,610,125	--	--
South Carolina	208,374	560,013	--	--
Tennessee	3,009,939	8,431,496	57,143,916	8,637,640
Total	10,674,394	31,947,176	96,172,806	14,964,553

1/ Publication of data would reveal individual plant operations.

Proportionate contributions to revenue were used to derive estimates of the total value of all products processed in the 70 plants. Total value of all products was estimated at $55 million. Of this amount, vegetables and vegetable products accounted for $48 million; fruit and fruit products, $6.4 million; other products, $0.6 million.

VALUE ADDED BY PROCESSING

The concept of "value added" as a barometer of economic activity in its relation to economic development, has received increased emphasis in recent years, especially in appraising contributions of "agri-business," that is, enterprises interdependent with agricultural production.

The difference between cost of raw product and value of the finished product is defined as the value added; it is attributable to manufacturing processes. For long-run survival, the revenue of a firm or an industry must be sufficient to cover the costs incurred in obtaining all productive goods and services required in its operation. These costs must include a fair return to land, labor, capital, and management. In vegetable processing as in other enterprises, this "fair" return must be measured in terms of the returns that these resources would command if employed in any available alternative use.

In vegetable processing, the cost of raw vegetable product and the cost of packaging materials can be considered as the variable inputs to which the processing operation contributes value. These inputs are expendable or consumed as final product. Sugar, salt, syrups, and other additives must also be included as consumable inputs. Such additives represent relatively insignificant costs in processing most of the products listed--they are not included in the analysis.

Because of mixes of products packed, such as green beans and potatoes, okra and tomatoes, and okra, corn, and tomatoes, it was not possible to follow individual

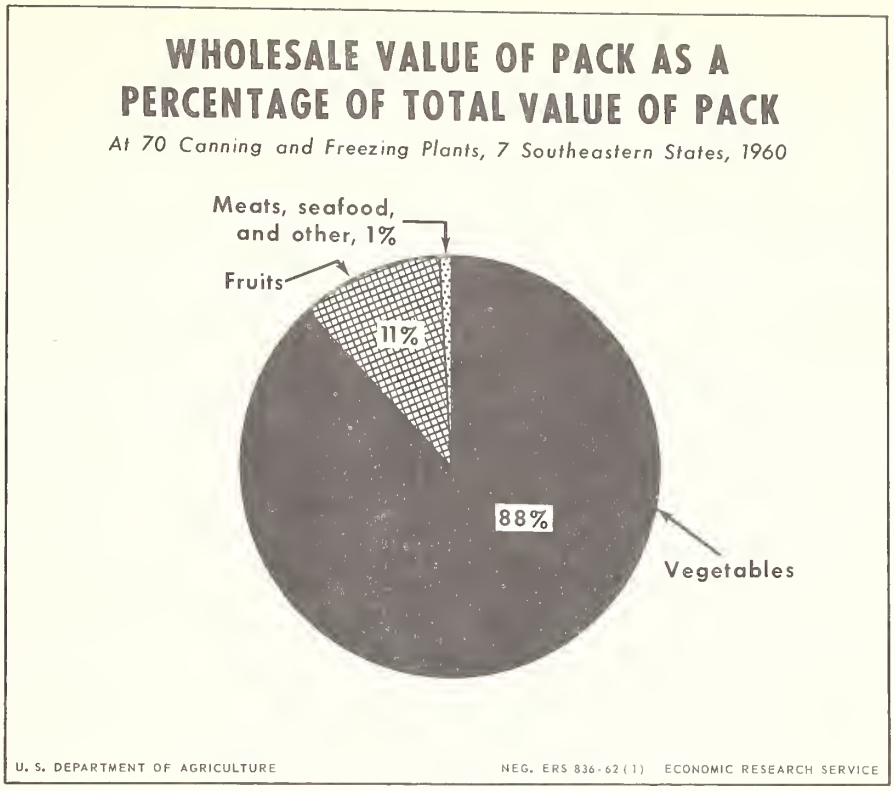

Figure 7

raw products through to returns for each product. In determining value added for product mixes, the raw product cost, cost of packaging materials, and returns from finished product were allocated proportionately to the individual vegetables comprising the mixes.

The total value added by the vegetable processing industry in the Southeast in 1960 was about $18.8 million. (table 10). Of this amount, canning contributed $12.4 million and freezing $6.4 million. The ratios of value added to returns from finished product averaged 0.37 for canned vegetables and 0.43 for frozen. This indicates that canners realized a margin of 37 percent of their gross returns to cover the cost of labor, capital, and management invested in the processing operation, compared with 43 percent for freezers.

Table 10.--Estimated value added by processing, 70 plants by product, 7 Southeastern States, 1960

Vegetable	Canning				Freezing				Total value added
	Cost of raw product	Cost of cans, labels, and shipping cartons 1/	Returns from finished product	Value added	Cost of raw product	Cost of cartons, labels, and shipping containers 2/	Returns from finished product	Value added	
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Beans:									
Green	3,443,075	3,282,959	8,157,095	2,431,061	2,348,698	445,033	3,120,590	326,859	2,757,920
Lima	3/	3/	3/	3/	219,256	133,135	1,096,203	743,812	743,812
Collards	36,659	66,614	119,595	16,322	110,945	169,898	636,800	355,957	372,279
Corn	60,950	110,456	343,172	171,766	3/	3/	3/	3/	171,766
Greens:									
Mustard	83,410	176,789	313,566	53,367	88,970	93,338	418,180	235,872	289,239
Spinach	86,381	163,389	339,918	90,148	156,106	117,866	579,434	305,462	395,610
Turnip	212,332	505,549	737,926	20,045	327,327	338,311	1,562,826	897,188	917,233
Kale	3/	3/	3/	3/	65,943	73.357	290,447	151,147	151,147
Kraut and kraut juice	194,000	496,933	1,254,690	563,757	---	---	---	---	563,757
Okra	115,966	171,439	533,399	245,994	859,015	370,364	2,341,641	1,112,262	1,358,256
Peas:									
Blackeye	23,605	39,019	108,521	45,897	973,206	264,208	1,840,362	602,948	648,845
Field	545,215	360,572	1,976,161	1,070,374	517,120	134,238	1,118,065	466.707	1,537,081
Pepper:									
Pimiento	2,440,499	824,417	7,154,196	3,889,280	---	---	---	---	3,889,280
Sweet 4/	492,178	513,620	1,786,762	780,964	3/	3/	3/	3/	780,964
Potatoes:									
Irish	349,245	647,335	1,225,911	229,331	3/	3/	3/	3/	229,331
Sweet	404,107	889,330	2,252,316	958,879	3/	3/	3/	3/	958,879
Squash	95,816	182,731	516,851	238,304	169,360	116,804	677,500	391,336	629,640
Tomatoes and tomato extracts	1,266,316	1,764,863	4,526,145	1,494,966	---	---	---	---	1,494,966
Other 5/	240,360	174,996	600,952	185,596	345,123	163.678	1,282,505	773,704	959,300
Total	10,090,114	10,371,011	31,947,176	12,486,051	6,181,069	2,420,230	14,964,553	6,363,254	18,849,305

1/ Basis of 24-303 cans. Assumed costs: Cans and lids, $0.8565 per case; labels, $0.0658 per case; shipping cartons, $0.0732 each. Total cost of cans, labels, and cartons $0.99 per case. Estimated for the Atlanta, Georgia, area.

2/ Based on 60 percent of pack going into 10-ounce cartons and 40 percent going into 2½ pound polyethylene bags. Assumed cost of packing: $0.03 per pound for packaging in 10-ounce cartons, including carton, overwrap, and shipping container; $0.017 per pound for 2½ pound bags, including bags and shipping container. Estimated for the Atlanta, Georgia, area.

3/ Publication of data would reveal individual plant operations.

4/ Also includes bell and green peppers.

5/ For canners, includes lima beans, kale, and rutabagas. For freezers, includes broccoli, cauliflower, corn, egg plant, onions, Irish potatoes, sweet peppers, and sweetpotatoes.

IMPLICATIONS

Several large-scale national food processors have established subsidiary vegetable processing plants in the Southeast. Such actions have notable economic implications for the vegetable industry of the region. Many vegetables grown in the Southeast, such as pimentos, field peas, okra, and several leafy greens, are not produced in volume in any other section of the country. Most of the Nation's supply of such vegetables is dependent upon Southeastern production. In their efforts to provide customers with a complete line of processed vegetables and to expand their markets, national processors and distributors must rely on Southeastern processing as a source for many items.

The processing of both fruits and vegetables in a single plant is common among Southeastern processors. In some plants, fruit processing is the predominant operation, in others, vegetables. Regardless of which product predominates, fruit and vegetable processing are complementary operations in many areas which produce both. Such combined operations have been suggested as a means of promoting greater efficiency in utilizing plants, equipment, and labor as well as providing buyers a wider choice of products.

The average volume of vegetables processed by freezing plants in 1960 was greater than the average volume reported by canning plants. Evidence indicates that the volume of frozen vegetables will likely increase further. The optimism of freezer operators is indicated by recent expansion of freezing facilities in Tennessee and Georgia.

The freezing industry in the region has made rapid progress in the relatively few years of its existence. In 1960, 97 percent of the fresh blackeye peas, 80 percent of the okra, 74 percent of the collards, and a majority of several other vegetables processed in the Southeast were frozen.

Vegetable processors in the Southeast apparently are well aware of the importance of expanding their operations, both in length of processing season and in number of products packed. This is evident in the trend among processors to extending the area from which they buy raw vegetables. Obtaining supplies from an increasingly larger area benefits the processor by (1) allowing him to operate his plant for a longer period of time each year, (2) adding to the number of products packed by taking advantage of longer production seasons, and (3) permitting more selectivity in improving product quality. Costs of transportation and product perishability are of course factors which limit procurement areas.

Extending the operating season and increasing the number of products packed tend to reduce costs per unit of output by increasing the quantity of output to which fixed costs are allocated. If, by increasing the volume of pack, processors can reduce the fixed costs per unit of output more than unit variable costs are increased, the net result will be a reduction in total production costs per unit of finished product. 4/

4/ Fixed costs include investment in land, buildings, equipment, taxes, insurance, and any other costs which do not vary within a season with volume of production, and are incurred whether or not the plant operates. Variable costs are those which are dependent upon and vary with the volume of pack and include labor, raw vegetable supplies, cans (or frozen food containers), labels, shipping cartons, additives, utilities, and selling costs.

In addition to its influence on costs, increasing the volume and number of products packed may directly affect marketing of finished products. Emphasis in marketing is increasingly on large-scale buying by retail food chains. Buyers for chain stores look to those processors who can supply in volume a fairly complete line of good quality vegetables. Small-lot buying by wholesale firms and independent buyers is apparently declining as chain stores increase their share of the retail food market. Small processors packing only a few products face increasing difficulty in finding satisfactory markets for their packs.

APPENDIX

Table 11.--Acreage of vegetables harvested for fresh market and for processing, by States, 1949-60

State	1949		1950		1951		1952	
	Fresh market	Processing	Fresh market	Processing	Fresh market	Processing	Fresh market	Processing
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Alabama	18,900	3,100	19,700	3,100	16,800	2,600	14,300	3,400
Florida	176,050	10,550	201,400	12,500	215,750	19,200	211,100	15,800
Georgia	38,400	4,200	39,000	6,000	34,650	6,000	32,550	8,700
Mississippi	17,150	6,600	15,280	5,000	12,250	5,730	11,300	5,300
North Carolina	48,000	11,000	49,760	11,580	47,230	14,100	42,200	14,500
South Carolina	35,900	5,850	35,650	5,600	30,640	7,760	30,810	6,200
Tennessee	8,300	12,270	8,000	12,860	7,300	11,960	6,900	12,040
Total	342,700	53,570	368,790	56,640	364,620	67,350	349,160	65,940
Combined total	396,270		425,430		431,970		415,100	
	1953		1954		1955		1956	
Alabama	13,800	2,160	13,700	2,400	13,600	3,200	12,300	3,250
Florida	200,650	28,300	212,300	23,700	212,250	21,700	210,450	19,200
Georgia	37,100	9,400	36,950	8,200	35,800	8,400	32,000	6,300
Mississippi	13,000	6,600	11,400	5,900	11,300	6,300	9,800	4,550
North Carolina	44,870	18,400	47,240	19,180	47,940	15,950	44,160	14,400
South Carolina	30,530	4,000	30,500	4,200	27,460	3,800	26,950	3,750
Tennessee	6,600	13,500	7,800	14,910	7,400	13,450	6,200	13,760
Total	346,550	82,360	359,890	78,490	355,750	72,800	341,860	65,210
Combined total	428,910		438,380		428,550		407,070	
	1957		1958		1959		1960	
Alabama	11,700	3,600	12,150	3,300	12,350	1,980	11,650	2,680
Florida	213,200	20,950	198,500	18,550	202,300	16,950	185,750	19,000
Georgia	31,850	6,900	32,000	8,400	27,550	6,100	22,450	9,400
Mississippi	9,700	5,850	8,500	6,450	6,350	6,500	5,350	6,050
North Carolina	45,490	19,960	48,405	23,580	44,700	18,900	42,750	18,200
South Carolina	26,650	5,100	25,450	4,600	24,250	4,000	26,500	5,200
Tennessee	6,480	13,620	6,550	15,380	6,000	13,890	5,360	15,900
Total	345,070	75,980	331,555	80,260	323,500	68,320	299,810	76,430
Combined total	421,050		411,815		391,820		376,240	

Source: Vegetables for Fresh Market, 1949-55, AMS Statistical Bulletin 212; Vegetables--Fresh Market, Annual Summaries. 1956-60 and Vegetables for Processing, 1949-55, AMS Statistical Bulletin 210; Vegetables--Processing, Annual Summaries, 1956-60

Table 12.--Production of vegetables for fresh market and for processing, 1/ States, 1949-60

State	1949		1950		1951		1952	
	Fresh market	Processing	Fresh market	Processing	Fresh market	Processing	Fresh market	Processing
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Alabama	41,800	5,100	43,300	7,200	41,000	7,400	28,950	5,600
Florida	776,050	26,000	907,550	30,700	1,021,900	60,100	1,005,000	44,400
Georgia	94,500	7,400	92,700	8,100	67,800	8,400	69,550	13,100
Mississippi	36,400	10,400	40,950	8,500	25,350	9,200	27,200	8,900
North Carolina	129,300	23,500	140,800	24,700	134,900	28,700	116,600	26,000
South Carolina	77,600	9,300	68,800	8,900	63,900	13,700	65,250	10,400
Tennessee	35,250	26,200	36,800	36,700	25,950	26,900	19,200	20,100
Total	1,190,900	107,900	1,330,900	124,800	1,380,800	154,400	1,331,750	128,500
Combined total	1,298,800		1,455,700		1,535,200		1,460,250	
	1953		1954		1955		1956	
Alabama	30,600	4,600	29,950	4,600	33,200	5,900	29,300	7,200
Florida	975,850	72,000	1,053,500	73,600	1,201,750	84,500	1,120,500	68,600
Georgia	87,150	11,200	83,350	14,600	76,950	16,100	76,600	11,800
Mississippi	38,350	9,800	32,450	12,500	22,500	14,900	26,400	10,300
North Carolina	129,350	36,400	128,150	31,000	141,150	35,700	129,550	28,400
South Carolina	60,100	4,000	59,950	5,400	55,650	7,000	62,750	6,800
Tennessee	19,600	24,400	23,150	26,300	27,150	29,400	24,750	28,500
Total	1,341,000	162,400	1,410,500	168,000	1,558,350	193,500	1,469,850	161,600
Combined total	1,503,400		1,578,500		1,751,850		1,631,450	
	1957		1958		1959		1960	
Alabama	32,150	6,600	32,300	8,400	30,750	4,900	27,550	7,400
Florida	1,014,200	65,300	821,750	57,800	967,700	51,700	1,009,800	65,000
Georgia	74,050	12,400	73,200	13,100	59,500	8,700	49,800	12,300
Mississippi	33,850	11,300	18,950	11,300	17,850	11,500	11,800	6,200
North Carolina	133,800	39,100	151,700	51,600	130,600	38,700	131,700	40,300
South Carolina	69,650	8,400	51,750	7,000	52,650	6,400	59,450	8,100
Tennessee	21,500	27,500	24,500	33,000	23,950	31,000	22,150	33,800
Total	1,379,200	170,600	1,174,150	182,200	1,283,000	152,900	1,312,250	173,100
Combined total	1,549,800		1,356,350		1,435,900		1,485,350	

Source: Vegetables for Fresh Market, 1949-55, AMS Statistical Bulletin 212; Vegetables--Fresh Market, Annual Summaries, 1956-60 and Vegetables for Processing, 1949-55; AMS Statistical Bulletin 210; Vegetables--Processing, Annual Summaries, 1956-60

Growth Through Agricultural Progress